



Comparison of the Plants in a Salt Marsh Ecosystem and Temperate Forest Ecosystem

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Abstract

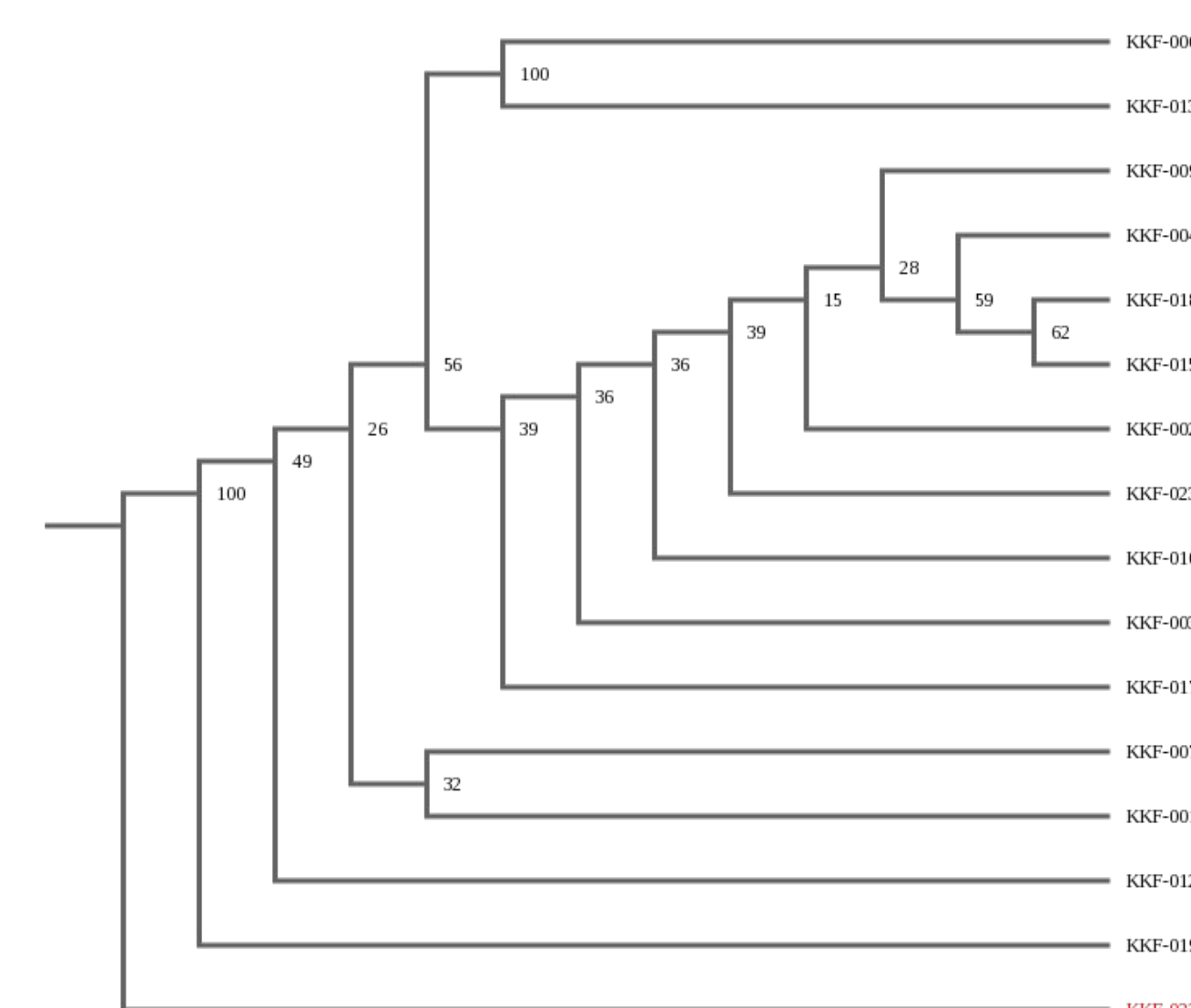
The reason we have researched this project is to identify the relationship between the plants in the temperate forest in Prospect Park the salt marsh in Bush Terminal Park. The process of one species branching into two different species is called speciation. Speciation occurs when there is geographic isolation and evolution. The purpose of this project was to see if the plants are invasive or native to the ecosystem based on the type of environment that they live in. We were trying to see if the plants in both of the areas are related evolutionarily. Our group took a class trip to Prospect Park and Bush Terminal Park to collect samples. After we collected enough data we started to record our data and documented it and we added the information of where the samples were found. Once returning from the trip, we froze our samples to preserve our samples. We were able to have access to the lab and now we understand how invasive and native species work in two of our local parks. Our results show that the Bush Terminal Park has way more native species than the Prospect Park. More native species help to build up healthy ecosystem.

Introduction

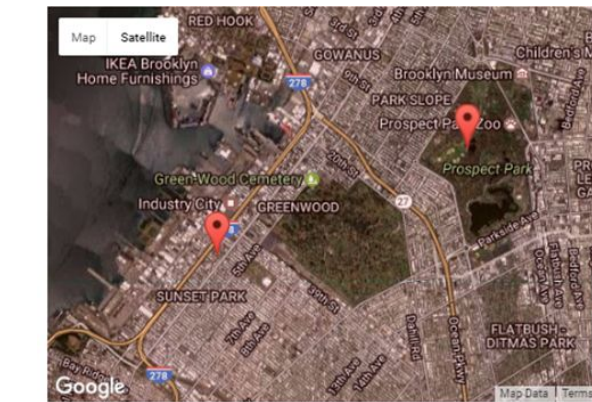
- The purpose of the project was to see the relationship between the plants in the temperate forest in Prospect Park and the salt marsh in Bush Terminal Park.
- One of the biggest reasons for this project was to identify geographic location and evolution.
- The process of one species branching into two different species is called speciation. Speciation occurs when there is geographic isolation and evolution.
- The purpose of this project was to see if the plants are invasive or native to the ecosystem based on the type of environment that they live in.
- We were trying to see if the plants in both of the areas are related evolutionarily.
- We were able to have access to the lab and now we understand how invasive and native species work in two of our local parks.

Materials & Methods

- Our group took a class trip to Prospect Park and Bush Terminal Park to collect samples.
- We had a permit that allowed us to sample plants in these two parks from the NYC Parks Department.
- We hoped to sample some specimens that are in the area.
- After we collected enough data we started to record our data and documented it and we added the information of where the samples were found.
- Once returning from the trip, we froze our samples to preserve our samples.
- We extracted DNA by adding the plant sample to a tube; then we added lysis solution to break down the cell and nuclear membrane and find the DNA. After that we ground the sample in solution
- Once we extracted the DNA, we amplified a small amount of DNA into an enormous amount. We amplified the DNA by using Polymerase Chain Reaction. We added primer mix into a fresh tube. After we added the DNA into the mix. We then amplified the DNA in a thermal cyclor. After we stored our sample at -20 degrees Celsius..
- We began gel electrophoresis. We used gel electrophoresis because it helped to separate the DNA. We first poured agarose gel into a container to form the gel. We waited 20 minutes to let the gel solidify. We then loaded DNA into the wells for preparation. After, we will sent electricity through the gel from negative to positive to pull the DNA across the gel. These processes were done for each sample we had collected. This allowed us to confirm that we have an amplified DNA sample.



Tables & Figures



Sample	Species	Dna Subway E-value Bit-Score Mismatche	Location plants was collected	Closely Related Plants	Native/ Invasive Species
KKF-1	Atractylodes lancea	Bitscore:10 67 E-value:0.0 Mismatches 3	Prospect Park	KKF-7	Invasive from China
KKF-2	Silene latifolia	Bitscore:10 34 E-value:0.0 Mismatches 0	Prospect Park	KKF-23	Native to the US
KKF-3	Daucus carota	Bitscore:10 68 E-value:0.0 Mismatches 0	Prospect Park	KKF-10	Native to southwest asia and parts of Europe
KKF-4	Ulmus glabra	Bitscore:88 1 E-value:0.0 Mismatches 14	Prospect Park	KKF-9	Native to northern and central Europe. Asia minor
KKF-6	Artemisia tridentata	Bitscore:10 77 E-value: 0.0 Mismatches 3	Prospect Park	KKF-13	Native to the US
KKF-7	Solidago missouriensis	Bitscore: 1063 E-value:0.0 Mismatches 4	Prospect Park	KKF-1	Native to the New Jersey but not to the New York
KKF-9	Rosa nutkana	Bitscore:10 79 E-value:0.0 Mismatches 2	Prospect Park	KKF-4	Native to the US
KKF-10	Persicaria pennsylvanica	Bitscore: 1014 E-value: 0.0 Mismatches 3	Prospect Park	KKF-3	Native to the US
KKF-12	Synphyrotic lum laeve	Bitscore:10 63 E-value:0.0 Mismatches 2	Prospect Park		Native to the US
KKF-13	Artemisia igniaria	Bitscore:10 36 E-value:0.0 Mismatches 2	Prospect Park	KKF-6	Native to the China
KKF-14	Low Quality Score	Bitscore: E-value: Mismatches	Prospect Park		
KKF-15	Silene latifolia	Bitscore:73 7 E-value:0.0 Mismatches 16	Bush Terminal Park	KKF-018	Native to the US
KKF-17	Low Quality Score	Bitscore: E-value: Mismatches	Bush Terminal Park		
KKF-18	Low Quality Score	Bitscore: E-value: Mismatches	Bush Terminal Park	KKF-15	
KKF-19	Synphyrotic lum entoni	Bitscore:10 76 E-value:0.0 Mismatches 5	Bush Terminal Park	KKF-22	Native to the US
KKF-22	Adenocaulon bicolor	Bitscore:10 54 E-value:0.0 Mismatches 6	Bush Terminal Park	KKF-19	Native to the US
KKF-23	No match in DNA subway	Bitscore: E-value: Mismatches	Bush Terminal Park	KKF-2	

Discussion

In the evolutionary tree most species had some shared evolutionary history. Although in other cases low bootstrap values would mean that species are closely related, being that the tree is fairly large, low bootstrap values are to be expected because there could be “nodes that are not found in the samples we collected” (Research Gate).

Our results show that the Bush Terminal Park has way more native species than the Prospect Park. Prospect Park has more invasive species than native. Indeed, more native species help to build up healthy ecosystem. According to American Forests, “we can expect to lose 95 percent of the species that once lived here unless we learn how to share our living, working, and agriculture spaces with biodiversity. Even modest increases in the native plant cover on suburban properties raise the number and species of breeding birds, including birds of conservation concern.” Therefore, Bush Terminal Park is healthier to grow plants due to have more native species which is very helpful to our environment and ecosystem.

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